

What is claimed is:

Claims

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1. A combined preparation for simultaneous, separate or sequential use as a contrast agent in ultrasound imaging, said preparation comprising:
    - i) an injectable aqueous medium having gas dispersed therein; and
    - ii) a composition comprising a diffusible component capable of diffusion in vivo into said dispersed gas so as at least transiently to increase the size thereof.
  2. A combined preparation as claimed in claim 1 wherein the dispersed gas comprises air, nitrogen, oxygen, carbon dioxide, hydrogen, an inert gas, a sulphur fluoride, selenium hexafluoride, an optionally halogenated silane, a low molecular weight hydrocarbon, a ketone, an ester, a halogenated low molecular weight hydrocarbon or a mixture of any of the foregoing.
  3. A combined preparation as claimed in claim 2 wherein the gas comprises a perfluorinated ketone, perfluorinated ether or perfluorocarbon.
  4. A combined preparation as claimed in claim 3 wherein the perfluorocarbon comprises a perfluoroalkane, perfluoroalkene or perfluorocycloalkane.
  5. A combined preparation as claimed in claim 2 wherein the gas comprises sulphur hexafluoride or a



intramuscularly, intravenously or by inhalation.

12. A combined preparation as claimed in any of claims 1 to 10 wherein the composition comprising the diffusible component further comprises a carrier liquid.

13. A combined preparation as claimed in claim 12 wherein the diffusible component is dispersed in an aqueous carrier liquid in the form of an oil-in-water emulsion or microemulsion.

14. A combined preparation as claimed in claim 13 wherein the diffusible component comprises an aliphatic ether, polycyclic oil, polycyclic alcohol, heterocyclic compound, aliphatic hydrocarbon, cycloaliphatic hydrocarbon or halogenated low molecular weight hydrocarbon.

15. A combined preparation as claimed in claim 14 wherein the diffusible component comprises a perfluorocarbon.

16. A combined preparation as claimed in claim 15 wherein the perfluorocarbon comprises a perfluoroalkane, perfluoroalkene, perfluorocycloalkane, perfluorocycloalkene or perfluorinated alcohol.

17. A combined preparation as claimed in claim 16 wherein the diffusible component comprises perfluoropentane, perfluorohexane or perfluorodimethylcyclobutane.

18. A combined preparation as claimed in any of claims 13

to 17 wherein the emulsion is stabilised by a phospholipid surfactant.

- 5 19. A combined preparation as claimed in claim 18 wherein at least 75% of the said phospholipid surfactant comprises molecules individually bearing net overall charge.
- 10 20. A combined preparation as claimed in claim 19 wherein at least 75% of the phospholipid surfactant is selected from phosphatidylserines, phosphatidylglycerols, phosphatidylinositols, phosphatidic acids and cardiolipins.
- 15 21. A combined preparation as claimed in claim 20 wherein at least 80% of said phospholipid surfactant comprises phosphatidylserines.
- 20 22. A combined preparation as claimed in any of the preceding claims which further includes a vasodilator drug.
- 25 23. A combined preparation as claimed in claim 22 wherein said vasodilator drug is adenosine.
- 30 24. A combined preparation as claimed in any of claims 1 to 21 which further includes a therapeutic agent.
25. A combined preparation as claimed in any of claims 1 to 21 which further includes contrast-enhancing moieties for an imaging modality other than ultrasound.

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26. A method of generating enhanced images of a human or non-human animal subject which comprises the steps of:

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- i) injecting a physiologically acceptable aqueous medium having gas dispersed therein into the vascular system of said subject;
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- ii) before, during or after injection of said aqueous medium administering to said subject a composition comprising a diffusible component capable of diffusion in vivo into said dispersed gas so as at least transiently to increase the size thereof; and
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- iii) generating an ultrasound image of at least a part of said subject.

27. A method as claimed in claim 26 wherein the composition comprising the diffusible component is administered cutaneously, subcutaneously, intramuscularly, intravenously or by inhalation.

28. A method as claimed in claim 26 or claim 27 wherein a vasodilator drug is coadministered to the subject.

29. A method as claimed in claim 28 wherein said vasodilator drug is adenosine.

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